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CANDY RESEARCH SUMMARY NO. 2

United States Department of Agriculture
Agricultural Research Service
Southern Utilization Research Branch

PEANUT BRITTLE RANCIDITY

Does the BUTTER develop rancidity?

Do the PEANUTS develop rancidity?

Will ANTIOXIDANTS help?

WHAT CAN BE DONE.

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U. S. DEPARTMENT OF AGRICULTURE

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New Orleans, La.

In Cooperation With

National Confectioners' Association
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AIC-368

JANUARY 1954

FOREWORD

This is the second of a series of Candy Research Summaries intended to present in concise and convenient form the conclusions reached in the experiments being conducted under the joint sponsorship of the Department of Agriculture and the National Confectioners' Association. They will be issued from time to time when the work on a particular problem is completed. Full details of the experiments upon which the conclusions are based will be found in the appropriate reports on "Progress in Candy Research," to which reference is made in this summary. This study was carried out on an experimental basis. It is suggested that any company wishing to act on these recommendations conduct experiments in its own factory under normal operating conditions.

This particular study is an extension of the research on Antioxidants reported in Research Summary No. 1. It deals specifically with Peanut Brittle to which dairy butter has been added. It answers the question of whether the butter in the brittle, or the peanut itself, is the cause for rancidity development. It also explains the effect of added antioxidants, and gives suggestions for minimizing the development of rancidity.

NATIONAL CONFECTIONERS' ASSOCIATION

John Henry, Chairman, Research Committee

1. *DOES THE DAIRY BUTTER BECOME RANCID?*

No. Butter no longer exists as such in the peanut brittle.

2. *WHAT HAPPENS TO THE BUTTER?*

The butter is changed by the high temperatures of the cooking process. Less than 5% of the amount of butter added to the brittle can be extracted with solvents, and this oily material is not butter. Its characteristics do not agree with those of pure dairy butter, as shown on the opposite page.

3. *DO THE PEANUTS BECOME RANCID?*

Yes. After peanut brittle is stored only 2-1/2 months at room temperature, oil in the peanuts develops rancidity.

4. *WHAT HAPPENS TO THE PEANUTS?*

In addition to the "off-flavor," the oil in the peanuts has been oxidized to change its chemical constitution. The fact that the peanuts are surrounded by hard candy does not seem to protect the peanuts against such deterioration.

5. *DO ANTIOXIDANTS HELP IN PEANUT BRITTLE?*

No. Antioxidants in the sugar part of the candy do not prevent rancidity in the peanuts.

6. *WHAT CAN BE DONE?*

USE FRESH PEANUTS. The fresher the peanut, the longer it will keep before becoming rancid. Peanuts stored under refrigeration should be satisfactory.

USE RUNNER PEANUTS. Runner peanuts in general have a longer shelf life than the Spanish or Virginia types.

DO ANTIOXIDANTS HELP OTHER TYPES OF CANDY?

Yes. Research Summary No. 1 pointed out the effectiveness of certain nutritive antioxidants for the stabilization of butter in candy. In peanut brittle, however, the butter does not exist in a form that can become rancid by oxidation. In butter creams, caramels, fudge, and other candies containing appreciable percentages of unaltered butter, antioxidants will increase shelf life from 3 to 5 times the normal period. Details of the application of yeast, oat concentrate, and a number of specific food antioxidants for this purpose have been reported in publications referred to on the last page.

RESULTS OF TESTS OF ANTIOXIDANTS IN PEANUT BRITTLE

Peanuts separated from candy phase and oil extracted after
2-1/2 months storage at room temperature,
followed by 2 months storage at 100° F.

Oil Extracted from:	Rancidity Index (Peroxide Values)
Brittle without Antioxidant	56
Brittle with Brewers' Yeast A	52
Brittle with Brewers' Yeast B	52
Brittle with Oat Flour Extract	53

A rancidity index higher than approximately 10 indicates detectable off-flavor.

COMPARISON OF MATERIAL EXTRACTED BY FAT SOLVENTS FROM SUGAR CANDY PART, WITH DAIRY BUTTER

	Material Extracted from Sugar Candy Part	Properties of Dairy Butter Fat
Extractable Material	0.14%	-------
Refractive Index	1.466	1.460
Saponification Value	140.4	216-235
Free Fatty Acids	2.06%	1.5-3.7%

The sugar part of the candy was made with 3% dairy butter. The small amount of material that could be extracted has different properties, showing that all of the butter was changed or combined with sugar during cooking. Refractive index, free fatty acids, and saponification values are characteristic properties by which fats may be identified.

References

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Progress in Candy Research, Reports Nos. 20-24, inclusive, and No. 27. Published by the National Confectioners' Association in cooperation with the U. S. Department of Agriculture.